UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION VII
726 MINNESOTA AVENUE
KANSAS CITY, KANSAS 66101

NOV 25 1992

Mr. Stephen J. Henderson
Plant Manager
Monsanto Chemical Company
1700 South Second Street
St. Louis, Missouri 63177-7040

RE: Comments Concerning the Health and Environmental Assessment Submitted with the RFI Report, Dated March 1992 for the J.F. Queeny Plant; EPA ID No. MOD004954111

Dear Mr. Henderson:

The Environmental Protection Agency (EPA) is providing Monsanto with general comments concerning the Health and Environmental Assessment (HEA) (Appendix G of the above-referenced document). Providing exhaustive comments on the HEA is not the intent of this letter. At some time in the future, the EPA plans on providing Monsanto with additional comments concerning specific exposure assumptions. As stated in the November 19, 1992, conference call, this letter is not intended to provide final approval of Monsanto's HEA methodology, but rather are suggestions for Monsanto's consideration.

The HEA was reviewed for compliance with RCRA Facility Investigation (RFI) Guidance, Volumes I-IV (1989, EPA 530/SW-89-031); Proposed Rules for Corrective Action for Solid Waste Management Units (SWMUs) at Hazardous Waste Management Facilities (Federal Register, Vol. 55, No. 145, July 27, 1990); the Risk Assessment Guidance for Superfund (RAGS) Volumes I and II (1989, EPA/540/1-89/001 and 002); the RAGS Supplemental Guidance Standard Default Exposure Factors (1991, OSWER Directive 9285.6-03); and, the RFI Work Plan for this site (October 1990).

As noted in specific comments, below, the HEA generally does not conform with the RFI guidance and the Proposed Rules for Corrective Action for Solid Waste Management Units (SWMUs) at Hazardous Waste Management Facilities. The methodology conforms, in part, with the Risk Assessment Guidance (RAGS) for Superfund. However, the quantity of analytical data are not sufficient to support a quantitative baseline risk assessment as described in the RAGS or an HEA as described in the RFI Guidance.

The following specific comments apply to Appendix G of the RFI Report.

Section 1.0 - INTRODUCTION

It is stated that the "purpose of the HEA is to evaluate the potential threat to human health and the environment resulting from constituents detected at the Queeny site in St. Louis, Missouri." This is not the purpose of an HEA as stated in the RFI Guidance and the Proposed Rules. According to the RFI Guidance (Volume 1, Section 8), the objective of the HEA is to use the results of media-specific investigations to determine whether interim corrective measures and/or a Corrective Measures Study (CMS) may be necessary. The RFI Guidance specifically states that, "It should be emphasized that the health and environmental criteria provided in this section do not necessarily represent clean-up target levels that must be achieved through the implementation of corrective measures. Rather, they establish presumptive levels that indicate that a closer examination is necessary. This closer analysis would generally take place as part of a CMS." The Proposed Rules state that "Action levels should be distinguished from cleanup standards, which are determined later in the corrective action process."

The RFI Guidance suggests that the HEA objective be accomplished in a two step process. First, potential human and environmental exposure routes are determined. Second, the measured constituent concentrations in the release are compared to EPA-established exposure limit criteria. When these criteria (also termed "action levels") are exceeded, or there is a reasonable likelihood of this occurring, a CMS will generally be required. In addition, the Proposed Rules state "the fact that no contaminants are found to exceed action levels does not preclude the Regional Administrator from requiring a CMS."

The RFI Guidance further suggests that the comparison of constituent concentrations with the criteria should be made for all measurements within the release area at and beyond the limit of each waste management area under study. Monsanto's HEA lacks measurements required to fulfill this criteria.

Section 3.0 - CONSTITUENT CHARACTERIZATION

The text states that the arithmetic mean, the 95th percent upper confidence limit of the arithmetic mean, and the range of concentrations detected at the site were used to describe the sampled media and that constituents of concern (COCs) were selected based on frequency of detection, concentration and toxicity. These criteria are ordinarily applied to contaminants present at sites where a baseline risk assessment (in accordance with the RAGS) is required and conducted. According to the RFI

Guidance, listed and characteristic wastes determined to be present during the RFI are subjected to evaluative criteria. Contaminant concentrations which exceed selected criteria are identified, and it is on this basis that the desirability to conduct a CMS is evaluated. While performing an HEA on soils for a RCRA facility, the EPA prefers that the methodology suggested in the RFI Guidance (Section 8.4) be used for selecting the constituents to be evaluated.

Section 3.2 - Groundwater Data Summary

This section summarizes groundwater contaminant data and refers to Table G3-7 for the frequencies of detection, range of detected values, and summary statistics for detected constituents. It should be noted that concentrations of all of the VOCs listed, and some of the semi-VOCs and inorganics listed exceed proposed RCRA Action Levels. On this basis alone a CMS would be initiated.

It is also noted that groundwater contamination of the deeper (bedrock) aquifer has not been included in the evaluation of groundwater data. A complete evaluation of potential migration of contaminants in groundwater in the deeper aquifer would be required in an HEA.

Section 4.2.3 - Migration in Surface Water

This section describes the transport of contaminants in groundwater migrating from the site to the Mississippi River. It is stated that the average total VOC concentration is likely to be 125 μg/L. The modeling assumptions may affect the VOC concentration assumed for the HEA, particularly if the final modeling concentration comes out higher than the concentration used for this rendition of the HEA. The adequacy of the assumptions used in deriving this estimate may not depict the conditions actually occurring at the facility. The choice of MODFLOW to simulate groundwater flow and SWIFT III for transport analysis are both acceptable EPA models. The no-source scenario is unrealistic at this time. No plan to remove contaminated soils from known source areas has been proposed by Monsanto. Also, based on available environmental data from the J.F. Queeny facility, there exists a significant probability of the existence of subsurface NAPLs, which would negate use of the no-source scenario. Therefore, the constant source scenario would be the only acceptable prediction model at this time.

The potential migration of semi-VOCs and inorganics into the Mississippi River should be addressed, especially since these compounds may be more likely to be adsorbed to sediment thereby resulting in a build-up of concentrations.

Section 6.1 - Exposure Pathways

The text states, "Nine industrial wells are located within one mile of the site.... All of these are in excess of 400 ft. deep and are not likely to be impacted by the site." This statement is an assumption which was not based on analytical data.

The text states that most areas on the site are pavement covered. The surface cover should be clearly depicted on a figure in order to make appropriate assumptions concerning exposure routes.

The text should be clarified to state that the potential exposures described apparently refer to exposures to surface water only. It is also possible that environmental receptors may be directly exposed to contaminated sediment and that human receptors may be exposed to contaminants in sediment via ingestion of contaminated fish. The Conceptual Site Model (Figure 6-1) should also include pathways for exposure to both surface water and sediment.

Section 6.2 - Exposure Dose Calculations

The RFI Guidance does not require the quantification of exposures during the HEA as described in this section. The USEPA 1989a reference, which refers to the RFI guidance series, is not appropriate to cite as a source describing standard USEPA upper bound exposure estimates. As noted above, the RFI Guidance does not suggest that the mean and the 95th percent upper confidence limit be used to estimate exposures. Instead they should be compared to criterion values.

Section 6.2.1 Soil

The sentence in the first paragraph stating "RfDs usually are based on applied rather than absorbed doses..." should read "RfDs usually are based on administered rather than absorbed doses..."

Exposure doses for the site worker who may be exposed to soil are discussed in this section and tabulated on Table G6-3. PCBs, which were detected at the Boiler Slag Area, are not included in the analysis of this scenario. Using the exposure parameters noted for the on-site worker and a soil concentration of 41 mg/kg PCBs, the carcinogenic risk due to ingestion only would be about 1×10^{-4}. This alone would raise concern that PCBs present in soil at the facility may represent an unacceptable health risk, and indicate the desirability of further study.

Section 6.2.2.2 - Swimming Exposure

Table G6-12 tabulates intakes of contaminants due to exposures while swimming in the Mississippi River. The derivation of the Mississippi River concentration for each COC should be presented.

One scenario that Monsanto may consider is ingestion of Mississippi River water. This could potentially happen while someone is swimming in the River.

Section 6.2.2.3 - Fish Ingestion

Table G6-14 tabulates intake of contaminants due to exposure from the ingestion of contaminated fish. As noted above, the derivation of the Mississippi River concentration for each COC should be presented.

This section should include consideration of the possible migration of contaminants from on-site groundwater and sediment to fish and human receptors.

Section 7.3 - Regulatory Standards and Criteria

This section incorrectly states that USEPA guidance for conducting HEAs directs that concentrations of constituents at exposure points be compared to relevant regulatory standards and criteria. Instead, the RFI guidance states that the "comparison of constituent concentrations with the criteria will be made for all measurements within the release at and beyond the limit of the waste management area." This is a relevant distinction.

Table G7-2 summarizes water quality criteria used for comparison with estimated surface water concentrations. The listed criteria are noted as being Missouri water quality criteria for the protection of aquatic life via chronic exposure. Federal Ambient Water Quality Criteria for the protection of human health due to fish consumption should also be listed as relevant criteria.

This section should also include a table indicating soil contaminant criteria (e.g., RCRA action levels for soil).

Section 7.4.2 - Groundwater

The text states in the 3rd paragraph that "constituent comparison with ARARs indicates that several constituents exceed current Federal and/or State criteria for drinking-water..." (Table G7-1). As previously noted, the comparisons were made to the UCL concentrations. According to RFI guidance, comparisons should be made to each sample point within the area of contamination.

Section 7.5.3 - Aquatic Effects

The text states in the 3rd paragraph that the primary fate of most inorganics released to the river would be sorption to sediments, yet the potential migration of these types of contaminants in groundwater into sediment was not considered in either the ecological or human health evaluations.

Additional comments

The EPA recommends that Monsanto evaluate the risk of chemical mixtures. Section 8.5 of the RFI Guidance suggests that there may be a situations where adverse affects occur due to the combination of multiple constituents. It appears that such an evaluation would be appropriate for the J.F. Queeny facility.

Concerning the HEA format, the reviewer would find it helpful if the equations are introduced and variables defined at the respective place in the text where it is being described.

If you have any questions concerning this letter, call Pat Nichols of my staff, at (913) 551-7674.

Sincerely yours,

Lyndell Harrington

Lyndell L. Harrington, P.E.
Chief, Permits Section
RCRA Branch
Waste Management Division

NOV 25 1992

Mr. Stephen J. Henderson
Plant Manager
Monsanto Chemical Company
1700 South Second Street
St. Louis, Missouri 63177-7040

RE: Comments Concerning the Health and Environmental Assessment Submitted with the RFI Report, Dated March 1992 for the J.F. Queeny Plant; EPA ID No. MOD004954111

Dear Mr. Henderson:

The Environmental Protection Agency (EPA) is providing Monsanto with general comments concerning the Health and Environmental Assessment (HEA) (Appendix G of the above-referenced document). Providing exhaustive comments on the HEA is not the intent of this letter. At some time in the future, the EPA plans on providing Monsanto with additional comments concerning specific exposure assumptions. As stated in the November 19, 1992, conference call, this letter is not intended to provide final approval of Monsanto's HEA methodology, but rather are suggestions for Monsanto's consideration.

The HEA was reviewed for compliance with RCRA Facility Investigation (RFI) Guidance, Volumes I-IV (1989, EPA 530/SW-89-031); Proposed Rules for Corrective Action for Solid Waste Management Units (SWMUs) at Hazardous Waste Management Facilities (Federal Register, Vol. 55, No. 145, July 27, 1990); the Risk Assessment Guidance for Superfund (RAGS) Volumes I and II (1989, EPA/540/1-89/001 and 002); the RAGS Supplemental Guidance Standard Default Exposure Factors (1991, OSWER Directive 9285.6-03); and, the RFI Work Plan for this site (October 1990).

As noted in specific comments, below, the HEA generally does not conform with the RFI guidance and the Proposed Rules for Corrective Action for Solid Waste Management Units (SWMUs) at Hazardous Waste Management Facilities. The methodology conforms, in part, with the Risk Assessment Guidance (RAGS) for Superfund. However, the quantity of analytical data are not sufficient to support a quantitative baseline risk assessment as described in the RAGS or an HEA as described in the RFI Guidance.

WSTM:RCRA:PRMT:PNICHOLS:LH:X7658:11-24-92:G:MQRISK.PAN

PRMT	GEOL	PRMT	PRMT	RCRA
NICHOLS	ROHRMAN	STEWART	HARRINGTON	Sanderson
T. Nichols 11/24/92	W. Rohrman 11-24-92	RLS 11-24	LH 11/24	MJS 11/25/92

The following specific comments apply to Appendix G of the RFI Report.

Section 1.0 - INTRODUCTION

It is stated that the "purpose of the HEA is to evaluate the potential threat to human health and the environment resulting from constituents detected at the Queeny site in St. Louis, Missouri." This is not the purpose of an HEA as stated in the RFI Guidance and the Proposed Rules. According to the RFI Guidance (Volume 1, Section 8), the objective of the HEA is to use the results of media-specific investigations to determine whether interim corrective measures and/or a Corrective Measures Study (CMS) may be necessary. The RFI Guidance specifically states that, "It should be emphasized that the health and environmental criteria provided in this section do not necessarily represent clean-up target levels that must be achieved through the implementation of corrective measures. Rather, they establish presumptive levels that indicate that a closer examination is necessary. This closer analysis would generally take place as part of a CMS." The Proposed Rules state that "Action levels should be distinguished from cleanup standards, which are determined later in the corrective action process."

The RFI Guidance suggests that the HEA objective be accomplished in a two step process. First, potential human and environmental exposure routes are determined. Second, the measured constituent concentrations in the release are compared to EPA-established exposure limit criteria. When these criteria (also termed "action levels") are exceeded, or there is a reasonable likelihood of this occurring, a CMS will generally be required. In addition, the Proposed Rules state "the fact that no contaminants are found to exceed action levels does not preclude the Regional Administrator from requiring a CMS."

The RFI Guidance further suggests that the comparison of constituent concentrations with the criteria should be made for all measurements within the release area at and beyond the limit of each waste management area under study. Monsanto's HEA lacks measurements required to fulfill this criteria.

Section 3.0 - CONSTITUENT CHARACTERIZATION

The text states that the arithmetic mean, the 95th percent upper confidence limit of the arithmetic mean, and the range of concentrations detected at the site were used to describe the sampled media and that constituents of concern (COCs) were selected based on frequency of detection, concentration and toxicity. These criteria are ordinarily applied to contaminants present at sites where a baseline risk assessment (in accordance with the RAGS) is required and conducted. According to the RFI

Guidance, listed and characteristic wastes determined to be present during the RFI are subjected to evaluative criteria. Contaminant concentrations which exceed selected criteria are identified, and it is on this basis that the desirability to conduct a CMS is evaluated. While performing an HEA on soils for a RCRA facility, the EPA prefers that the methodology suggested in the RFI Guidance (Section 8.4) be used for selecting the constituents to be evaluated.

Section 3.2 - Groundwater Data Summary

This section summarizes groundwater contaminant data and refers to Table G3-7 for the frequencies of detection, range of detected values, and summary statistics for detected constituents. It should be noted that concentrations of all of the VOCs listed, and some of the semi-VOCs and inorganics listed exceed proposed RCRA Action Levels. On this basis alone a CMS would be initiated.

It is also noted that groundwater contamination of the deeper (bedrock) aquifer has not been included in the evaluation of groundwater data. A complete evaluation of potential migration of contaminants in groundwater in the deeper aquifer would be required in an HEA.

Section 4.2.3 - Migration in Surface Water

This section describes the transport of contaminants in groundwater migrating from the site to the Mississippi River. It is stated that the average total VOC concentration is likely to be 125 μg/L. The modeling assumptions may affect the VOC concentration assumed for the HEA, particularly if the final modeling concentration comes out higher than the concentration used for this rendition of the HEA. The adequacy of the assumptions used in deriving this estimate may not depict the conditions actually occurring at the facility. The choice of MODFLOW to simulate groundwater flow and SWIFT III for transport analysis are both acceptable EPA models. The no-source scenario is unrealistic at this time. No plan to remove contaminated soils from known source areas has been proposed by Monsanto. Also, based on available environmental data from the J.F. Queeny facility, there exists a significant probability of the existence of subsurface NAPLs, which would negate use of the no-source scenario. Therefore, the constant source scenario would be the only acceptable prediction model at this time.

The potential migration of semi-VOCs and inorganics into the Mississippi River should be addressed, especially since these compounds may be more likely to be adsorbed to sediment thereby resulting in a build-up of concentrations.

Section 6.1 - Exposure Pathways

The text states, "Nine industrial wells are located within one mile of the site.... All of these are in excess of 400 ft. deep and are not likely to be impacted by the site." This statement is an assumption which was not based on analytical data.

The text states that most areas on the site are pavement covered. The surface cover should be clearly depicted on a figure in order to make appropriate assumptions concerning exposure routes.

The text should be clarified to state that the potential exposures described apparently refer to exposures to surface water only. It is also possible that environmental receptors may be directly exposed to contaminated sediment and that human receptors may be exposed to contaminants in sediment via ingestion of contaminated fish. The Conceptual Site Model (Figure 6-1) should also include pathways for exposure to both surface water and sediment.

Section 6.2 - Exposure Dose Calculations

The RFI Guidance does not require the quantification of exposures during the HEA as described in this section. The USEPA 1989a reference, which refers to the RFI guidance series, is not appropriate to cite as a source describing standard USEPA upper bound exposure estimates. As noted above, the RFI Guidance does not suggest that the mean and the 95th percent upper confidence limit be used to estimate exposures. Instead they should be compared to criterion values.

Section 6.2.1 Soil

The sentence in the first paragraph stating "RfDs usually are based on applied rather than absorbed doses..." should read "RfDs usually are based on administered rather than absorbed doses..."

Exposure doses for the site worker who may be exposed to soil are discussed in this section and tabulated on Table G6-3. PCBs, which were detected at the Boiler Slag Area, are not included in the analysis of this scenario. Using the exposure parameters noted for the on-site worker and a soil concentration of 41 mg/kg PCBs, the carcinogenic risk due to ingestion only would be about 1×10^{-4}. This alone would raise concern that PCBs present in soil at the facility may represent an unacceptable health risk, and indicate the desirability of further study.

Section 6.2.2.2 - Swimming Exposure

Table G6-12 tabulates intakes of contaminants due to exposures while swimming in the Mississippi River. The derivation of the Mississippi River concentration for each COC should be presented.

One scenario that Monsanto may consider is ingestion of Mississippi River water. This could potentially happen while someone is swimming in the River.

Section 6.2.2.3 - Fish Ingestion

Table G6-14 tabulates intake of contaminants due to exposure from the ingestion of contaminated fish. As noted above, the derivation of the Mississippi River concentration for each COC should be presented.

This section should include consideration of the possible migration of contaminants from on-site groundwater and sediment to fish and human receptors.

Section 7.3 - Regulatory Standards and Criteria

This section incorrectly states that USEPA guidance for conducting HEAs directs that concentrations of constituents at exposure points be compared to relevant regulatory standards and criteria. Instead, the RFI guidance states that the "comparison of constituent concentrations with the criteria will be made for all measurements within the release at and beyond the limit of the waste management area." This is a relevant distinction.

Table G7-2 summarizes water quality criteria used for comparison with estimated surface water concentrations. The listed criteria are noted as being Missouri water quality criteria for the protection of aquatic life via chronic exposure. Federal Ambient Water Quality Criteria for the protection of human health due to fish consumption should also be listed as relevant criteria.

This section should also include a table indicating soil contaminant criteria (e.g., RCRA action levels for soil).

Section 7.4.2 - Groundwater

The text states in the 3rd paragraph that "constituent comparison with ARARs indicates that several constituents exceed current Federal and/or State criteria for drinking-water..." (Table G7-1). As previously noted, the comparisons were made to the UCL concentrations. According to RFI guidance, comparisons should be made to each sample point within the area of contamination.

Section 7.5.3 - Aquatic Effects

The text states in the 3rd paragraph that the primary fate of most inorganics released to the river would be sorption to sediments, yet the potential migration of these types of contaminants in groundwater into sediment was not considered in either the ecological or human health evaluations.

Additional comments

The EPA recommends that Monsanto evaluate the risk of chemical mixtures. Section 8.5 of the RFI Guidance suggests that there may be a situations where adverse affects occur due to the combination of multiple constituents. It appears that such an evaluation would be appropriate for the J.F. Queeny facility.

Concerning the HEA format, the reviewer would find it helpful if the equations are introduced and variables defined at the respective place in the text where it is being described.

If you have any questions concerning this letter, call Pat Nichols of my staff, at (913) 551-7674.

Sincerely yours,

Lyndell L. Harrington, P.E.
Chief, Permits Section
RCRA Branch
Waste Management Division